24-12-14/24

Radiometric investigation of zones of interaction of slag with liquid metal during electric arc welding.

there is a possibility of reactions between the metal and the slag developing directly on the electrode tip prior to the molten drop tearing away from it; with decreasing dimensions of the drops tearing off the electrode, the intensity of interchange of sulphur between the metal and the slag decreases.
There are 8 figures, 1 table and 16 references, all of which are Slavic.

SUBMITTED: March 6, 1957.

AVAILABLE: Library of Congress.

Card 3/3

AUTHORS: Yur'yev, S. F. and Kusnitsina, Z. I. SOV/126-6-1-21/35

TITLE: On the Selective Evaporation of Certain Metals from a Steel Surface During Heating in Vacuum (Ob izbiratel'nom isparenii nekotorykh metallov s poverkhnosti stali pri nagreve v vakuume)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 1, pp 157-166 (USSR)

ABSTRACT: The authors carried out experiments for the purpose of evaluating the selective evaporation of Cr, Mn, Fe, Ni and, particularly, Mo from the surface of cuts of two grades of steel (Table 2, p 158; in this table the percentages are given but obviously due to a printing error the elements to which the percentages refer are omitted) heated to 1200°C in a vacuum of 10^{-4} mm Hg; one of the steels was alloyed with more volatile admixtures (Mn, Cr), the other was alloyed, in addition to volatile Cr, with Ni and Mo which are less inclined to evaporate. The heating in vacuum was effected on a test rig for high temperature microscopic investigations of the structure and was accompanied by subsequent local spectrum analytical analysis of the state of the surface

Card 1/6

On the Selective Evaporation of Certain Metals from a Steel Surface During Heating in Vacuum

subjected to heating at a given temperature during a given time; thereby the spark was localised to an area not exceeding 0.06 mm dia. and a depth of 2μ (the local spectrum analysis of the specimen surface was effected by Engineer G. G. Afanas'yeva). The specimen was heated non-uniformly along the length so that the maximum temperature was reached in the middle where the hot joint of the thermocouple was welded on. The points analysed by spectrum analysis were spaced at 2.5 mm beginning from the middle of the specimen. The spectral determination was repeated three times at points of equal distance from the centre of the specimen and, according to calibration temperature curves, the temperature was determined which was maintained in the specimen at the level of each of the analysed points. This enabled determining the dependence of the residual concentration of the analysed elements as a function of the heating temperature for a given heating duration. On the basis of the results, which are described, graphed and discussed, the following conclusions are arrived at: 1) heating in vacuum of multi-

component metallic alloys, and particularly of alloy steel, is accompanied by selective evaporation of metals, as a result of which the initial composition of the surface layer of the metal changes appreciably.

2) Of the five elements under consideration (Mn, Cr, Fe, Ni, Mo) Mn has the highest inclination to evaporate. In the temperature range 700-1200°C at a vacuum of 10^{-4} mm Hg, the tendency to evaporate is lower for chromium and lower still for Fe; nickel, and particularly Mo, almost do not evaporate at all under the given conditions.

3. The relative intensity of participation of the components in the evaporation of a multi-component system in vacuum at high temperatures is particularly in agreement with the relative values of the vapour tension of the pure components under the conditions of experiment.

4. The intensity of evaporation of the volatile components from the steel depends (in addition to temperature, the pressure above the evaporation surface and the vapour tension of the components) on the initial concentration of the elements in the alloy, increasing with

On the Selective Evaporation of Certain Metals from a Steel Surface During Heating in Vacuum

increasing concentration of the respective component.
5. The change in the composition of the surface layer of alloy steel as a result of evaporation is accompanied by appreciable changes in its properties, particularly by intensive changes in the resistance to corrosion; the effect of these changes is determined by the volatility of the alloying elements and their influence on the respective properties of the steel.
6. Data on the change of the composition of the surface of the steel during the process of evaporation enabled establishing the composition of the vapour which separates out from the steel surface, provided that the system contains at least one element which does not participate in the evaporation or an element for which the degree of evaporation is known.
7. Application of numerous vacuum instruments for investigating the structure and the properties of metals at elevated temperatures is inadmissible without taking into consideration the variability of the composition of the surface of the metal during the tests. In the case

On the Selective Evaporation of Certain Metals from a Steel Surface During Heating in Vacuum

of multi-component systems, application of such instruments should be strictly limited as regards the permissible temperatures and for short durations so as to ensure relative constancy of the composition and the properties of the metallic surface. In absence of such limitations, utilisation of results of anisometric, dilatometric, durometric, magnetic and electric measurements, and particularly of micro-structural observations, at elevated temperatures under high vacuum involves greater or lesser errors due to the fact that the results of the measurements will no longer apply to an alloy of the initial composition.

SOV/126-6-1-21/33

On the Selective Evaporation of Certain Metals from a Steel Surface During Heating in Vacuum

There are 6 figures, 2 tables and 19 references, 18 of which are Soviet, 1 English.

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut sudostroitel'noy promyshlennosti
(Central Scientific Research Institute of the Ship-Building Industry)

SUBMITTED: March 6, 1956 (Initially)
November 19, 1956 (after revision)

1. Steel alloys--Temperature factors 2. Steel alloys--Microstructure 3. Metals--Spectrographic analysis 4. Steel alloys--Properties

Card 6/6

GULYAYEV, A.P., doktor tekhn.nauk, prof.; DELLE, V.A., doktor tekhn.nauk, prof.; YUR'YEV, S.F., doktor tekhn.nauk, prof.; BORZDYKA, A.M., doktor tekhn.nauk; VYAZNIKOV, N.F., kand.tekhn.nauk

"Principles of steel alloying" by [prof.] V.S.Mes'kin. Reviewed by A.P.Guliaev and others. Stal' 21 no.5:454-455 My '61. (MIRA 14:5)

(Steel alloys--Metallurgy)

ACCESSION NR: AP4040691 S/0129/64/000/006/0028/0033

AUTHOR: Yur'yev, S. F.; Sakharova, Ye. V.

TITLE: Chemical conversion coating of Ti with an Ni-P anti-friction alloy

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 6, 1964, 28-33

TOPIC TAGS: chemical coating, titanium, nickel, phosphorus, anti friction alloys, sand blasting, H_2SO_4, pickling, galling, galvanizing

ABSTRACT: The authors attempted to determine the optimal conditions under which a dispersion-hardening Ni-P alloy can be deposited on Ti for the improvement of anti-friction properties. The formation of an insoluble oxide film on the Ti surface, which would not permit thorough cohesion, was prevented by the formation of a dense Ti hydride film which increased the active surface because of its roughness, and dissociated at low temperatures. Sandblasting prior to pickling drastically improved the interaction of Ti with the working solution and increased the thickness of the Ni case,

Card 1/2

ACCESSION NR: AP4040691

particularly after a short pickling period. Sulfuric acid (spec. gravity 1,89) was found to be a most effective pickling agent at 80C. Optimal cohesion was observed after 2 hr holding at 400C and 2 min. pickling. Dry friction tests of 10-40 micron layers showed clearly improved anti-friction properties. In interconnecting two surfaces with a 20-40 micron Ni layer galling occurs only under a load of 180 to 200 kg/cm^2 and friction coefficients are 0.12 to 0.15 for 20 micron layers and 0.15 to 0.30 for 40 micron layers. By increasing the thickness galling occurs at 80 kg/cm^2. The coefficient of friction is 0.15 to 0.35. A further advantage of the Ni layer is the possibility of galvanizing. The orig. art. has: 4 figures.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00

SUB CODE: MM NR REF SOV: 000 OTHER: 000

Card 2/2

YUR'YEV, S.F.; SAKHAROVA, Ye.V.

Chemical coating of titanium with an antifriction nickel-phosphide. Metalloved. i term. obr. met. no. 6:28-33 Je '64. (MIRA 17:7)

L 1145-66 (A)

AUTHOR: Gur'yanov, G. I.; Losnakevich, B. P.; Pinovskiy, M. L.; Gavrilova, F. A.;

...elkova, Ye. ...

... izobreteniy i tovarnykh znakov, no. 14, 1965, 74

Card 1/2

pair of horizontal discs which move in the vertical direction. These discs are

SUBMITTED: 16Oct61 ENCL: 01 SUB CODE: IE

BELOSSEL'SKIY, S.S., predsedatel' Vserossiyskogo Komiteta Osvobozhdeniya; YUR'YEV, S.V., general'nyy sekretar'; KONDRATOVICH, S.L., nachal'nik Organizatsionnogo Otdela.

From the All-Russian Freedom Committee to all Russian national organizations. Nashi vesti 9 no.36:10-11 Ag '53. (MLRA 6:7)

1. Vserossiyskiy Komitet Osvobozhdeniya. (Refugees)

SOV-25-58-7-38/56

AUTHOR: Yur'yev, V., Candidate of Technical Sciences

TITLE: A Flying Micrometer (Letuchiy mikrometr)

PERIODICAL: Nauka i zhizn', 1958, Nr 7, pp 67-68 (USSR)

ABSTRACT: Engineer G.Kh. Zarezankov of the Tsentral'naya laboratoriya avtomatiki tresta "Energochermet" (Central Automation Laboratory of the "Energochermet" Trust) has solved the problem of how to carry out exact measurements of wire dimensions during the rolling process. The proposed method consists in lighting-up the wire with a parallel flow of light and projecting the shadow on a screen, where it is measured without touching the wire. The device is increasing the productivity of rolling mills and improving the quality of the rolling process. The article presents a detailed description of the procedure. There are 2 diagrams.

1. Wire--Production 2. Wire--Measurement

Card 1/1

YUR'YEV, V.

They were delegates to the 14th Congress of the Communist Youth League. Prof.-tekh. obr. 19 no.5:15 My '62. (MIRA 15:5)
(Vocational education)

YUR'YEV, V.

Good friendship. Prof.-tekh. obr. 19 no.7:17 Jl '62. (MIRA 15:12)
(Community and school)

YUR'YEV, V.

Interesting work of the Communist Youth League members. Prof.-tekh.obr. 22 no.4:2-3 Ap '65. (MIRA 18:5)

YUR'YEV, V.

Extra-airfield glider and airplane landings. Kryl. rod. 16 no.7:14-15 Jl '65. (MIRA 18:8)

1. Instruktor 2-go Moskovskogo gorodskogo aerokluba.

YUR'YEV, V.

"Good day, Ivan Ivanovich!" Prof.-tekh. obr. 22 no.9:29-30 S '65.
(MIRA 18:9)

YUR'YEV, V.

Training based on glorious traditions. Prof.-tekh. obr. 22 no. 12:17 D '65 (MIRA 19:1)

YUR'YEV, V.A.

Results of hydrolysate therapy in digestive disorders in children. Vopr. pediat. 19 no.2:28-34 1951. (CLML 20:8)

1. Of the Department of Biochemistry (Head--Prof. L.T. Solov'yev) and of the Department of Faculty Pediatrics (Head--Honored Worker in Science Prof. M.S. Maslov, Active Member of the Academy of Medical Sciences USSR), Leningrad Pediatric Medical Institute (Acting Director--Prof. Yu.A. Kotikov).

USSR

Method for continuous refractometric and chromato- CH

YUR'YEV, V. A., OFITSEROVA, V. N. (Deceased), SOLOV'YEV, L. T. (Deceased), LOPATINA, N. I., SALAZKINA, S. S. (Deceased), KRYMSKAYA, V. M. and USHAKOVA, M. S.

"The Separation of Mixtures of Amino Acids by the Method of Exchange Adsorption in Columns Filled With Synthetic Resins," an article included in the book "The Theory and Practice of the Application of Ion-Exchange Agents," edited by K. V. Chmukov and published by AS USSR, 1955, 164pp.

Distr: [illegible]

Simple device for a refractometer [illegible] chromatographic analysis. S. S. [illegible], [illegible] and [illegible]. [illegible] 1956 [illegible]. To obtain continuous [illegible] escaping from a chromatographic column a simple cell was attached above the lower prism of a refractometer. The metallic frame of the lower prism was [illegible] with a [illegible] layer of molten paraffin and [illegible] balsam. A thin, undistorted glass [illegible] was slightly warmed and placed [illegible] slight pressure was [illegible] which constituted the cell. [illegible] were directed towards the cell [illegible] the paraffin, and a [illegible] from the cell was [illegible] capillary cell of a [illegible] full for observation. [illegible] Krainer

5

Electrophoretic studies of the fractional composition of proteins of the skeletal muscles of vertebrates in ontogenesis. I. I. Ivanov, V. A. Nurev, V. V. Kadykov, B. M. Krymskaya, V. P. Moiseeva, and S. B. Tukhachinskii (Pediatr. Med. Inst., Leningrad). *Biokhimiya* 21, 601–9 (1956).—In these expts. the striated muscles of rabbits were used. The Tiselius electrophoresis app. was employed in the electrophoretic studies, and the results were then verified by paper electrophoretic studies. In the embryonic and early post-natal periods of the development of the animal changes take place in the fractional composition of the proteins of the striated muscles; there is an increase in the actomyosin fraction of which the precursor of the actomyosin complex is the precursor. Electrophoretic analysis of the striated muscle proteins from salt soln. with an ionic strength of 0.4 bring the above mentioned changes into sharper relief. It is supposed that similar changes may take place in the proteins of the stroma during the ontogenesis of vertebrates. The content of proteins of the actomyosin complex in embryonic tissue approximates that of the smooth muscles of mesenchyme origin (in vertebrates).

B. S. Levine

USSR/Human and Animal Physiology - Metabolism. V-2

Abs Jour : Ref Zhur - Biol., No 1, 1958, 3657

Author : I.I. Ivanov, V.A. Yur'yev, V.V. Kadykov, B.M. Krymskaya, V.P. Moiseyeva, S.Ye. Tukachinskiy

Inst : Academy of Sciences, USSR

Title : Proteins of the Proactomyosin Complex in Ontogeny.

Orig Pub : Dokl. AN SSSR, 1956, 111, No 3, 649-651

Abstract : The fractional composition of proteins in the somatic muscles of rabbits at various stages of embryonic and post-natal development was studied by means of free electrophoresis and paper electrophoresis. There was a great difference in the fractional composition of muscular proteins between embryonic and new-born rabbits, on one hand, and adult animals on the other hand. The contracting capacities of the proteins corresponed to

Card 1/2

Abs Jour : Ref Zhur - Biol., No 1, 1958, 3657

the particularities of their composition. In presence of ATF [ATP ?], the contracting ability of protein fibers from muscle proteins is the less pronounced the younger is the animal. Therefore, there is - in ontogeny - a gradual change of the fractional composition of the striated muscle proteins towards an increase of the actomyosin fraction, which is formed from the "proactomyosin complex".

IVANOV, I.I.; YUR'YEV, V.A.; NOVOZHILOV, D.A.; MIKHAYLOVSKAYA, L.A.; KRYMSKAYA, B.M.

Biochemical determination of the functional condition of muscles in poliomyelitis. Vop.med.khim. 5 no.4:243-250 Jl-Ag '59.
(MIRA 12:12)

1. Kafedra biokhimii Leningradskogo pediatricheskogo meditsinskogo instituta i biokhimicheskaya laboratoriya Nauchno-issledovatel'skogo detskogo ortopedicheskogo instituta imeni G.I. Turnera.
(POLIOMYELITIS pathol.)
(MUSCLE PROTEINS)

IVANOV, K.I.; MAKHOVA, Z.N.; ZINOV'YEVA, I.P.; MIROVICH, N.I.; MOISEYEVA, V.P.; PARSHINA, E.A.; TUMACHINSKIY, S.Ye.; YUR'YEV, V.A.

Fractional composition of proteins and contractile function of various muscle types. Biokhimiia 24 no.3:451-458 My-Je '59. (MIRA 12:9)

1. Biochemical Laboratory of the Institute of Obstetrics and Gynecology, Academy of Medical Sciences of the U.S.S.R., Chair of Biochemistry of the Pediatric Medical Institute, and the Institute of Blood Transfusion, Leningrad.
(MUSCLE PROTEINS,
fractional composition, eff. on musc. contraction (Rus))

IVANOV, I.I.; KODYKOV, V.V.; YUR'YEV, V.A.

Globulin X as a separate protein. Biul.eksp.biol. i med. 48 no.7:46-50 Jl '59. (MIRA 12:10)

1. Iz kafedry biokhimii Leningradskogo pediatricheskogo meditsinskogo instituta. Predstavlena deystvitel'nym chlenom AMN SSSR V.N.Orekhovichem.

(GLOBULINS)

YURYEV, V. A., ZHAKHOVA, Z. N., IVANOV, I. I., BERG, YU. N., LEBEDEVA, N. A., LOPATINA, N. I., MIROVICH, N. I., and TUKACHINSKIY, S. Y.
(USSR)

"Proteins of various Muscle Myofibrils and the Problem of Tone."

Report presented at the 5th International Biochemistry Congress, Moscow, 10-16 Aug 1961

IVANOV, Il'ya Il'ich; YUR'YEV, Vladimir Anatol'yevich; PARSHIN, A.N., red.; CHUNAYEVA, Z.V., tekhn. red.

[Biochemistry and pathobiochemistry of muscles] Biokhimiia i patobiokhimiia myshts. Leningrad, Gos. izd-vo med. lit-ry Medgiz, 1961. 274 p. (MIRA 14:8)

(BIOCHEMISTRY) (MUSCLE)

YUR'YEV, V.A.; STEPANOVA, M.M.

Use of ion exchange resins in the chromatographic determination of amino acids in urine. Lab. delo 7 no.3:11-13 Mr '61. (MIRA 14:3)

1. Kafedra biologicheskoy khimii Leningradskogo pediatricheskogo meditsinskogo instituta.

(URINE--ANALYSIS AND PATHOLOGY)
(AMINO ACIDS) (PAPER CHROMATOGRAPHY)
(ION EXCHANGE)

YURIEV, V.A.

Muscle proteins in vascular walls and changes in the amount in hypertension. Biul. eksp. biol. i med. 51 no.5:59-63 My '61.
(MIRA 14:8)

1. Iz kafedry biokhimii Leningradskogo pediatricheskogo meditsinskogo instituta. Predstavlena deystvitel'nym chlenom AMN SSSR V.M.Karasikom.
(ARTERIES) (MUSCLE) (HYPERTENSION)

KADYKOV, V.V.; YUR'YEV, V.A.; PRINTSEV, M.D.; MATROSOVA, A.V.

Characteristics of the protein composition of sarcoplasm in various muscles. Zhur. evol. biokhim. i fiziol. 1 no.3:205-212 My-Je '65. (MIRA 18:7)

1. Kafedra biokhimii Leningradskogo pediatricheskogo meditsinskogo instituta.

YUR'YEV, V.A.; LOPATINA, N.I.; ZHAKHOVA, Z.N.; MITROSOVA, A.V.

Enzymatic properties of metamyosin. Biul.eksp.biol.i med. 58 no.7:54-57 Jl '64. (MIRA 18:2)

1. Biokhimicheskaya laboratoriya (zav. - dotsent V.A.Yur'yev) Instituta akusherstva i ginekologii (dir. - prof. M.A.Petrov-Maslakov) AMN SSSR, Leningrad. Submitted April 5, 1963.

YUR'YEV, V.A.

In memoriam of V.V. Oppel', 1900-1962. Vop. med. khim. 9 no.1:105-106 Ja-F '63. (MIRA 17:6)

L 05300-67 AWT(d) GD

ACC NR: AT6015370 SOURCE CODE: UR/0000/65/000/000/0163/0167

AUTHOR: Yur'yev, V. F.; Shepelenko, K. O.

54
B+1

ORG: none

TITLE: Some problems in generating numerical information for visual observation

SOURCE: AN BSSR. Institut tekhnicheskoy kibernetiki. Vychislitel'naya tekhnika (Computer engineering). Minsk, Nauka i tekhnika, 1965, 163-167

TOPIC TAGS: digital computer, computer technology, computer output unit, real time data display, electroluminescence panel, digital decoder, signal decoding

25

ABSTRACT: Alphanumeric characters can be formed on electroluminescent display panels consisting of individually controlled elements. Separate logic modules are used for each character to be generated, such that no information concerning the structure of the characters need be stored. The output of the character-generating modules is channeled to the appropriate position on the display panel. Each display module consists of 40 elements, arranged in 5 rows and 8 columns. The individual elements are actuated by applying voltages of opposite polarities to the corresponding x and y terminals. The display unit consists of three modules: the electroluminescent panel, the driver unit, and the character generating logic module. A single pulse from the computer control logic module initiates the formation of a character by opening a gate and admit-

Card 1/2

L [illegible]-67
ACC NR: AT6015370

ting clock pulses into the character generating logic module. The clock pulses are used to actuate each row driver from 1 to 8 in succession. The corresponding column drivers are either actuated or inhibited by the outputs from the character generating logic module. Thus a number or a letter is formed by the luminescing elements at the intersections of actuated columns and the sequentially energized rows. Since only the columns require logic control, 5 instead of 8 control functions are necessary. Transistor-ferrite core combinations are used in the character generating logic module. This approach to visual data presentation is convenient, simple, and flexible. Convenient, because a single pulse is required to initiate the display of character; simple, because of the minimum number of logical operations, and therefore few components, are necessary to generate a character; flexible, because the character selection can be in any sequence, hence, this display may be used with any computer. Orig. art. has: 2 figures.

SUB CODE: 09/ SUBM DATE: 15Dec65

Card 2/2 gd

YUR'YEV, V. 158T104

USSR/Physics - Polarization Mar 50
Transparency

"Transparency and Polarizing Ability of Polyvinyl Polaroids in Ultraviolet," V. Yur'yev, 2 pp

"Uspekh Fiz Nauk" Vol XL, No 3

Considers transparency of single and "crossed" polyvinyl polaroid plates in ultraviolet versus wave length (relative to intensity of nonpolarized light incident upon a plate 0.13 mm thick).

158T104

IUR'EV, V.

RT-937 (Phase displacement during the reflection of light by thin layers) Sdvig fazy pri otrazhenii sveta tonkimi plenkami.
USPEKHI FIZICHESKIKH NAUK, 44(1): 283-287, 1951

DUR'EV, V.

Dur'ev, V. The anisotropy of the human eye and its receptors. P. 287.

SO: Progress in the Physical Sciences, Vol. XLIV, No. 2, June 1951 (Uspekhi)

IUR'EV, V.

RT-943 (Oscillations of piezoelectric crystals investigated by the method of multi-ray interferometry) Izluchenie kolebanii p'ezolektricheskikh kristallov metodami mnogoluchevoi interferometrii.
USPEKHI FIZICHESKIKH NAUK, 44(4): 629-630, 1951.

YUR'YEV, V. G.

USSR/Physics - Secondary Electrons Aug 52

"Electron Emission and Reflection of Potassium and Lithium Ions From Oxidized Tungsten and Tantalum," M. A. Yeremeyev, V. G. Yur'yev

"Zhur Tekh Fiz" Vol 22, No 8, pp 1290-1295

In previous works by Yeremeyev and Shestukhina (see 226T89, and 226T90) ion reflection from pure metals were studied. In current article authors attempt to establish the effect of oxide coated metals on the studied phenomenon. Authors state that the coef of

226T93

secondary electron emission at low temps from oxidized metals is higher than from pure metals and reaches its max at 600° K. Received 7 Apr 51.

226T93

YUR'YEV, V.

Interferometer

Three-opening interferometer. Usp. fiz. nauk 47 no. 1, 1952

Monthly List of Russian Accessions. Library of Congress. November 1952. UNCLASSIFIED

YUR'YEV, V.

USSR/Physics - Miscellaneous Reviews Nov 53

"From the Current Literature" (5 reviewers, indicated by initials only, except V. Yur'yev)

Usp Fiz Nauk, Vol 51, No 3, pp 406-425

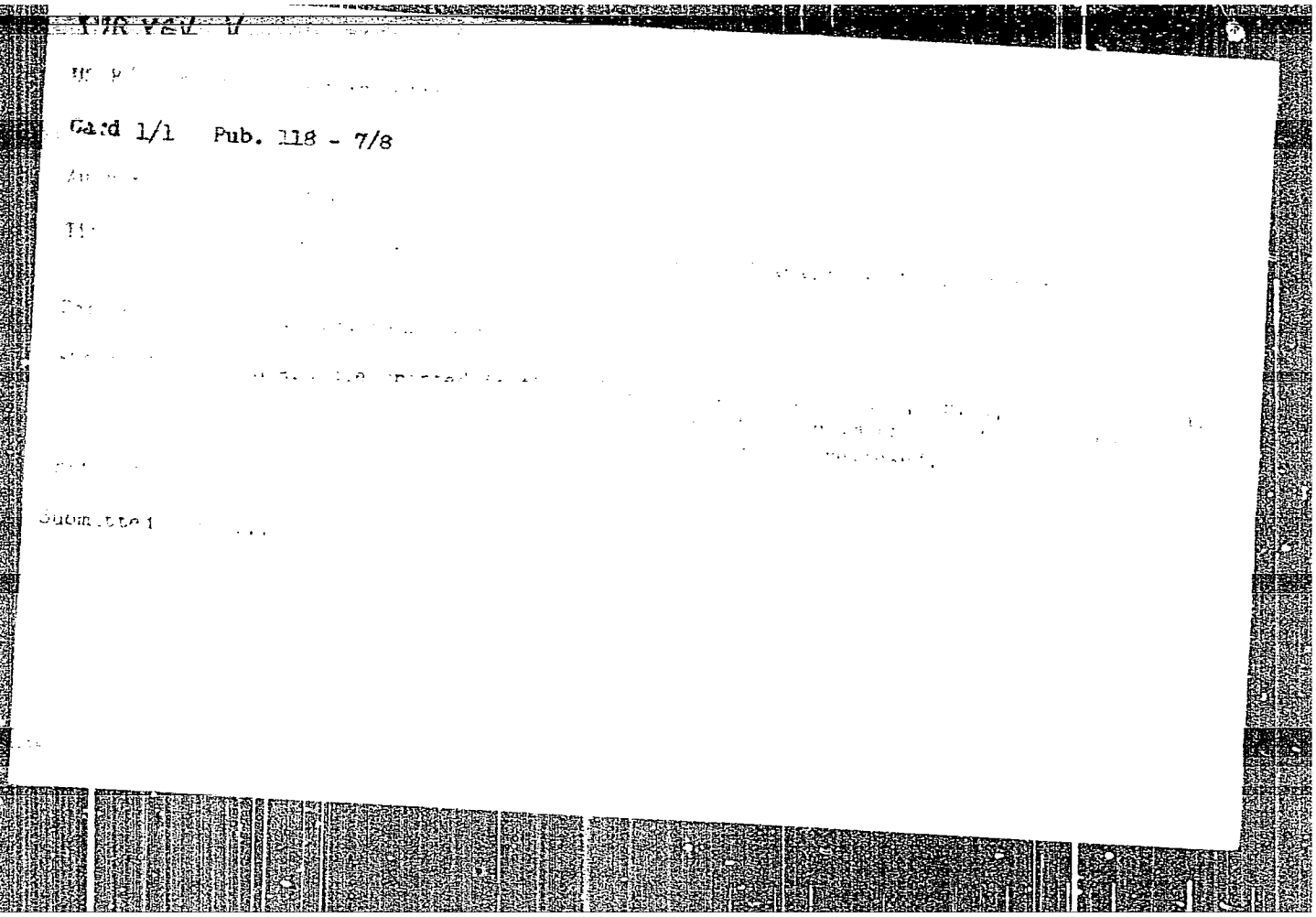
Reviews of Western literature on the following subjects: Participation of carbon's 3d orbits in the formation of interatomic bonds; retarding particles in showers; stabilization of amplification of photo-multipliers; stable dosimeter made of CdS single-crystal: automatic counter of interference bands; refractometer for gases and liquids with the use of phase contrast (reviewed by V. Yur'yev).

272T91

YUR'YEV, V. [reviewer]; INGELSTAM, E. [author].

Refractometer for gases and liquids using the phase contrast (From: Ark. för Fys. 6 no.4 (29), 287, 1953) E. Ingelstam. Reviewed by V. IUrev. Usp. fiz. nauk 51 no.3:421-425 N '53. (MLRA 6:12)

(Refractometer) (Ingelstam, E.)



Card 1/1 Pub. 118 - 7/8

24(6)

AUTHORS: Kolenko, Ye.A., Yur'yev, V.G. SOV/57-28-10-23/40

TITLE: Investigation of Some Vacuum Properties of Epoxide Resin (Issledovaniye nekotorykh vakuumnykh svoystv epoksidnoy smoly)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, Vol 28, Nr 10, pp 2259-2259 (USSR)

ABSTRACT: This is an investigation of some vacuum characteristics of epoxide resins free from filling substances with a polymerization temperature of 140° C. The vapor pressure at various temperatures was determined by the loss-of-weight method during an 8 hours' heating. At 20° C the vapor pressure amounts to 2.10^{-4} mm of mercury column. A protracted degassing of polymerized resins leads to a cessation of gas separation (the loss of weight was not determined). After the resin had been degassed at 150° C a mass spectrogram was recorded at 100° C. No peaks distinctive of the resin were found in this connection. The mass-spectrographical measurements were carried out by Ya.A. Yukhvidin. In the course of the investigations it was substantiated that epoxide resins after polymerization are vacuum resistant materials. The excellent adhesion properties of the resins make possible a production of high-vacuum joints with glass and with various other materials. There are 1 table and 2 references, 2 of which are Soviet.

Card 1/2

Investigation of Some Vacuum Properties of Epoxide Resin

SOV/57-28-10-23/40

SUBMITTED: May 30, 1958

Card 2/2

KOLENKO, Ye.A.; SHCHERBINA, A.G.; YUR'YEV, V.G.

Method of eliminating heat from semiconductor cooling devices.
Zhur. tekh. fiz. 28 no.11:2543-2545 N '58. (MIRA 12:1)
(Semiconductors) (Cooling)

05466
SOV/120-59-3-37/46

AUTHORS: Kolenko, Ye. A., Protopopov, Kh. V., Fleyshman, D. G., and Yur'yev, V. G.

TITLE: Thermoelectric Cooling of Photomultipliers (Termoelektricheskoye okhlazhdeniye fotoumnozhiteley)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 3, pp 140-142 (USSR)

ABSTRACT: The device is seen in section in Fig 1; the cooler 11 consists of 80 junctions joined in series and embedded in epoxide resin. The cold ends are in contact with part 3, which touches the glass via springs 2. Cylinder 9 is of insulating material. The heat is removed by the chassis 4. The light enters through a hole in the chassis and cooler; the device is meant for use with star-followers. Fig 2 shows another model, in which the heat is removed by water; the device is meant for use in assays for natural ^{14}C. The units consume 20 - 25 W and provide temperatures 30 - 35°C below room temperature (about -10°C at the photocathode) over volumes of some 800 cm^3. The photocathode must be earthed in this system. Fig 3 shows the noise spectrum of an 11-stage multiplier relative to a solution of p-terphenyl (5 g/litre) at two temperatures. Fig 4

Card 1/2

05466
SOV/120-59-5-37/46

Thermoelectric Cooling of Photomultipliers

shows similar curves for four different types of multiplier; the cooler raises the efficiency of the system for ^{14}C to about 90%. There are 4 figures and 4 references, 3 of which are Soviet and 1 English.

ASSOCIATION: Institut poluprovodnikov AN SSSR (Institute of Semiconductors, Academy of Sciences USSR)

SUBMITTED: May 7, 1958

Card 2/2

SOV/120-59-4-33/50

AUTHORS: Kolenko, Ye. A. and Yur'yev, V. G.

TITLE: A Hygrometer with Thermoelectric Cooling

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 4, pp 137-139 (USSR)

ABSTRACT: The most widely used method of measuring humidity is based on determination of the temperature at which dew condenses, known as the dew point. In a hygrometer described in the present paper (a photograph is shown in Fig 1 and a schematic circuit in Fig 2) the dew point is deduced from the change of the surface conductivity of a glass plate cooled by a semiconductor battery. The hygrometer consists of the following main components: 1) a cooling system; 2) a dew indicator; 3) a bridge based on the 6Zh1Zh valve; 4) a two-stage magnetic amplifier assembled by N. V. Sharygin; 5) a rectifier used to supply the bridge, the amplifier and the semiconductor battery; 6) micro-thermistors for temperature measurement; 7) a fan for drawing in the gas whose humidity is to be measured. The cooling system (Fig 3) consists of a semiconductor thermoelectric battery made of two elements (9 mm^2 cross-section, 2mm height) and a radiator for removal of heat from the "hot" junctions of the battery. To reduce

Card 1/4

A Hygrometer with Thermoelectric Cooling

the temperature fall between the "hot" junction of the thermoelectric battery and the surrounding air, the radiator surface is made somewhat larger (1000 cm^2) than that indicated by theoretical design calculations. This larger area ensures a greater efficiency of cooling by the battery. Under steady-state conditions and the optimum current through the battery, the "cold" junction is cooled to -11°C (from +20°C) in 50 to 60 sec. When air is drawn through the instrument at 3 m/sec the thermal load on the thermoelectric battery is naturally greater than under steady-state conditions and a temperature of -10°C is established at the "cold" junction. A glass plate of 2 mm width, 5 mm length and 0,2 mm thickness, is used as the dew indicator. A sputtered layer of platinum, with a central gap of 10-50 μ width, is deposited on the glass plate (Fig 4). Contact with the two portions of the platinum layer is made via fired silver electrodes. The glass plate is stuck to the semiconductor battery. When the battery cools down the glass plate so that a dew condenses

A Hygrometer with Thermoelectric Cooling

on it, the layer of water, which then bridges the gap between the two portions of the platinum film, lowers sharply the resistance of the gap. In order to avoid the effects of the surrounding medium the battery and the plate are insulated by a special jacket and the gas whose humidity is to be measured is drawn through a special pipe. When dew condenses in the gap on the platinized glass plate the measuring bridge becomes unbalanced and a 30-40 μA signal reaches the magnetic amplifier. The unbalance signal, amplified to 24 mA, opens a relay RKS which breaks the supply circuit of the semiconductor battery. The glass plate is then warmed by the surrounding air and the condensed moisture evaporates. When the moisture has evaporated, the relay closes and connects up the supply to the semiconductor battery and the process is repeated. The temperature which is the mean between the dew condensation and evaporation points is indicated by a thermistor MT-54 mounted directly below the glass plate. Temperature of the surrounding medium is measured by another thermistor placed in the stream of gas passing through the instrument. Sensitivity of the hygrometer depends on the width of the gap in the platinum film on the glass plate. When this width is 10 μ (corresponding to a resistance of 1-1.5 MΩ

A Hygrometer with Thermoelectric Cooling

when dry) the hygrometer records dew condensation several seconds earlier than observed by means of a microscope with a magnification of 119. Since the hygrometer sensitivity is governed primarily by the operation time of the amplifier and the relay, small gaps on the platinized glass plate are not necessary. Measurements during one condensation and evaporation cycle take 20-30 sec. The dew point is determined to within ±1°C; the scatter does not exceed 0.5°C. The hygrometer can be used to measure humidity of gases with a dew point from +20 to -2°C. It is not possible to measure humidity of drier gases since then water condenses as a solid film (ice) and the surface conductivity of the glass plate does not alter sufficiently sharply to produce a large enough signal. There are 5 figures and 7 references, 4 of which are Soviet and 3 English.

ASSOCIATION: Institut poluprovodnikov AN SSSR (Institute for Semiconductors, Academy of Sciences, USSR)

SUBMITTED: May 7, 1958.

S/181/60/002/011/035/042
B006/B060

26.1632

AUTHOR: Yur'yev, V. G.

TITLE: Thermoelectric Properties of a Gaseous Semiconductor

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 11, pp. 2929-2931

TEXT: A. F. Ioffe has pointed out that a weakly ionized gas may be regarded as a gaseous semiconductor and that the methods usually applied in semiconductor physics may serve for its investigation. This idea has been taken up by B. Ya. Moyzhes and G. Ye. Pikus, who have developed a theory of gaseous semiconductors. For a verification of this theory, the author of the paper under consideration has conducted tests whose preliminary results are published here. The author worked out a device with a cylindrical cathode and a molybdenum anode; the cathode was heated by electron bombardment, the temperature being measured by an optical pyrometer. The anode temperature did not exceed 800°K, while that of the cathode ranged between 1100 and 2200°K. Cesium vapor was introduced in the interelectrode spacing. A distinct saturation appeared in the volt-ampere characteristics; the saturation current practically equalled the short-

Card 1/4

Thermoelectric Properties of a Gaseous Semiconductor

S/181/60/002/011/035/042
B006/B060

circuit current. The figure illustrates the dependence of the saturation current on the mutual temperature at cesium vapor pressures of 1 mm Hg and $4 \cdot 10^{-4}$ mm Hg. If the scattering takes prevalently place on atoms and the mean free path is considerably smaller than the electrode spacing d and is independent of the ionic concentration, the saturation current is then given by $j_s = 2eD_a n/d$, where $D_a = 1/3 S_a N_a$, the diffusion coefficient, and $n = \sqrt{N_e N_a} \exp(-eV_i/2kT)$, the equilibrium carrier concentration corresponding to the cathode temperature. N_a - concentration of Cs atoms at the cathode, $N_e = 2(2\pi mkT/h^2)^{3/2}$, V_i - ionization potential of Cs, S_a - scattering cross section on atoms, $\bar{v}$ the thermal velocity of electrons. If, on the other hand, the scattering on ions prevails and the mean free path is inversely proportional to the carrier concentration, then $j_s = \frac{2eD_i n}{d} \ln \frac{ne\bar{v}}{4j_s}$, where $D_i n = \bar{v}/3S_i$ and S_i is the scattering cross section on the ions. As may be seen from the figure, the theoretical relations are in very good agreement with the measurement values. At $T < 1700^\circ K$ the

Card 2/4

S/181/60/002/011/035/042
B006/B060

Thermoelectric Properties of a Gaseous Semiconductor

scattering on atoms prevails, while that on ions prevails at $T > 1700^{\circ}K$. It may be thus regarded as proven that the thermocurrent in a gaseous thermoelement is determined by the diffusion of electrons from the hot to the cold electrode. Mobility and thermoelectric properties of the ionized gas were directly measured by an instrument, in which the two electrodes were heated simultaneously. Measurements were made at pressures of up to 1.7 mm Hg and temperatures of 1500-2400°K. Tests showed that the electrical conductivity in the interelectrode spacing at 0.6-1.7 mm Hg and the mentioned temperature range does not change by more than the threefold, while the carrier concentration changes by over the 300 fold. This proves that at $T > 1700^{\circ}K$ the scattering on ions prevails. At 1700°K the thermo-emf of the ionized gas $\alpha_{exp} = 1.7$ mv/deg and $\alpha_{theor} = 1.98$ mv/deg, which shows that the temperature of the ionized gas is near the electron temperature.

Academician A. F. Ioffe and A. R. Regel' are thanked for their interest, B. Ya. Moyzhes and G. Ye. Pikus for advice, D. N. Mirlin, Ye. A. Kolenko, I. G. Artem'yev, and R. L. Vengerovskiy for assistance. There are 1 figure and 4 references: 2 Soviet and 2 US.

Card 3/4

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Thermoelectric Properties of a Gaseous Semiconductor

S/181/60/002/011/035/042
B006/B060

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of Semiconductors of the AS USSR, Leningrad)

SUBMITTED: July 23, 1960

4

Card 4/4

S/057/62/032/006/019/022
B108/B102

26.1640
24.2120

AUTHORS: Mirlin, D. N., Pikus, G. Ye., and Yur'yev, V. G.

TITLE: Determination of the electron scattering cross section from the electrical conductivity of a slightly ionized gas

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 6, 1962, 766 - 769

TEXT: A method of determining the scattering cross section of slow electrons from the conductivity of a slightly ionized gas is proposed. For this purpose, the ionized gas has to be in thermodynamic equilibrium. From the voltampere characteristics at low temperature gradients between cathode and anode it is then possible to determine the electrical conductivity and the scattering cross section. The voltage applied must be low enough for the electrons to cause no ionization in the plasma. For concrete conductivity measurements, a special apparatus with plane high-melting electrodes was designed. Measurements with cesium vapor at 1500°K gave an electron scattering cross section of $2 \cdot 10^{-14}$ cm^2. There are 3 figures.

Card 1/2

Determination of the electron...

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors AS USSR, Leningrad)

SUBMITTED: April 20, 1961 (initially),
June 13, 1961 (after revision)

Card 2/2

S/057/62/032/006/020/022
B108/B102

26.1640

AUTHORS: Martsinovskiy, A. M., Pikus, G. Ye., Sonin, B. E., and Yur'yev, V. G.

TITLE: Effect of electrode barriers on the electrical conductivity of a cesium plasma

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 6, 1962, 770 - 772

TEXT: In an earlier paper (FTT, II, no. 4, 756, 1960) a method was proposed for determining the scattering cross section from measurements of the electrical conductivity of a cesium plasma. It was not considered, however, that the electron work function depends on temperature and pressure of the Cs vapor. In order to explain the effect of the electrode barriers, the authors of the present paper used a special arrangement with movable electrodes to measure the dependence of the plasma resistivity R on the length d of the gap between the electrodes. It was found that R increases linearly with d. Measurements with d = 0 showed that at high temperatures there is an additional resistance owing to a layer of cesium adsorbed on the electrodes. This layer increases the work function. This

Card (1/2)

Effect of electrode barriers...

is also the reason why the efficiency of plasma thermocells decreases. It is therefore necessary to increase pressure in these cells in order to reduce the work function. There are 2 figures.

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors AS USSR, Leningrad)

SUBMITTED: November 21, 1961

Card 2/2

3h631
S/056/62/042/002/003/055
B102/B138

24.2120
24.6710

AUTHORS: Pikus, G. Ye., Skvortsov, N. S., Yur'yev, V. G.

TITLE: Measurement of electron mobility from the change in the resistance of a plasma in a magnetic field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 2, 1962, 330 - 337

TEXT: The authors have developed a method for making direct measurements of electron mobility in a plasma. It will be published in the ZhTF. For this method the electron concentration and active surface area of the electrons must be known. It was used to measure the electron mobility in a weakly ionized cesium plasma. A special apparatus was designed, to hold the plasma in thermodynamic equilibrium so that its temperature is determined by that of the electrodes. The whole arrangement was placed in a solenoid, to produce the magnetic field, and then in a thermostat. The conditions are different from those obtaining with semiconductors, since the plasma electrons are freely movable and the Hall emf equals zero. The theory of the behavior of plasma electrons is developed and formulas are

Card 1/4

S/056/62/042/002/003/055
B102/B138

Measurement of electron ...

derived for the conductivity ratio with and without field

$\sigma'_H/\sigma_0 = \left\langle \frac{\quad}{1+(\quad)^2} \right\rangle / \langle \varepsilon \rangle$ and $\sigma_H/\sigma_0 = \left[\sigma_0/\sigma'_H + \sigma_0 H^2 d^2/12\eta c^2\right]^{-1}$;

η is the viscosity of the gas, d the electrode distance and τ the electron relaxation time; σ_0 = enu, u = $(e/m)\langle\varepsilon\tau\rangle/\langle\varepsilon\rangle$, u is the electron mobility, the $\langle\ldots\rangle$ denote averaging over Maxwell distribution. In weak magnetic fields,

$\sigma_H/\sigma_0 = -\gamma\,(uH/c^2)\,(1 + end^2/12\eta u\gamma)$. (22), in strong fields

$\sigma'_H/\sigma_0 = (2/\gamma_{-1/2})\,(c/uH)^2$,

$\frac{\sigma_0}{\sigma_H} = \frac{\gamma}{2}\left(\frac{uH}{c}\right)^2\left(1 + \frac{end^2}{6\eta u\gamma}\right)$ (23)-(24). The experimental conditions with Cs plasma were chosen so that $\sigma_H/\sigma_0 = \sigma'_H/\sigma_0$. At T = 1625°K and p_{Cs} = 0.4 mm Hg, the following experimental results were obtained:

Card 2/4

S/056/62/042/002/003/055
B102/B138

Measurement of electron ...

H =	66 oe	90 oe	126 oe
σ_H/σ_o	0.96	0.93	0.86
$10^{-8}u_H$, cm^2 oe/v.sec	0.161	0.22	0.33
$10^{-5}u$, cm^2/v.sec	2.4	2.4	2.6

For the mobility, u, a slight decrease was observed with increasing T. At temperatures above 1800 °K the u values obtained from conductivity measurements without, ($u_R = 4el/3\sqrt{2\pi mkT}$; l-mean free path) are somewhat lower than those (u_H) from measurements with, magnetic field. The divergence is greatest at 2000°K. The fact that with increasing T, u_R decreases a little faster than u_H, is attributed to the more rapid increase in Q_R with T. The cross section ratio is $Q_H/Q_o = (R/R')^{1/2}$, $R = R_o + R'$ is the total resistance; $Q_H/Q_o = (Q_R/Q_o)^{1/2}$. At T<1600°K both methods yield $Q_o \approx 3 - 4 \cdot 10^{-14}$ cm^2. B. Ya. Moyzhes, V. L. Gurevich, E. V. Sonin are

Card 3/4

thanked for discussions and D. N. Mirlin, A. M. Martsinovskiy, B. I. Tsirkel' and I. G. Artem'yev for help. There are 4 figures and 10 references: 7 Soviet and 3 non-Soviet. The three references to English-language publications read as follows: R. B. Brode. Rev. Mod. Phys., 5, 257, 1933; Phys. Rev. 34, 673, 1929; J. Esterman et al. Phys. Rev. 71, 250, 1947.

ASSOCIATION: Institut poluprovodnikov Akademii nauk SSSR (Institute of Semiconductors of the Academy of Sciences USSR)

SUBMITTED: June 30, 1961

YUR'YEV, V. G.

Dissertation defended for the degree of Candidate of Physicomathematical Sciences at the Technical Physics Institute imeni A. F. Ioffe in 1962:

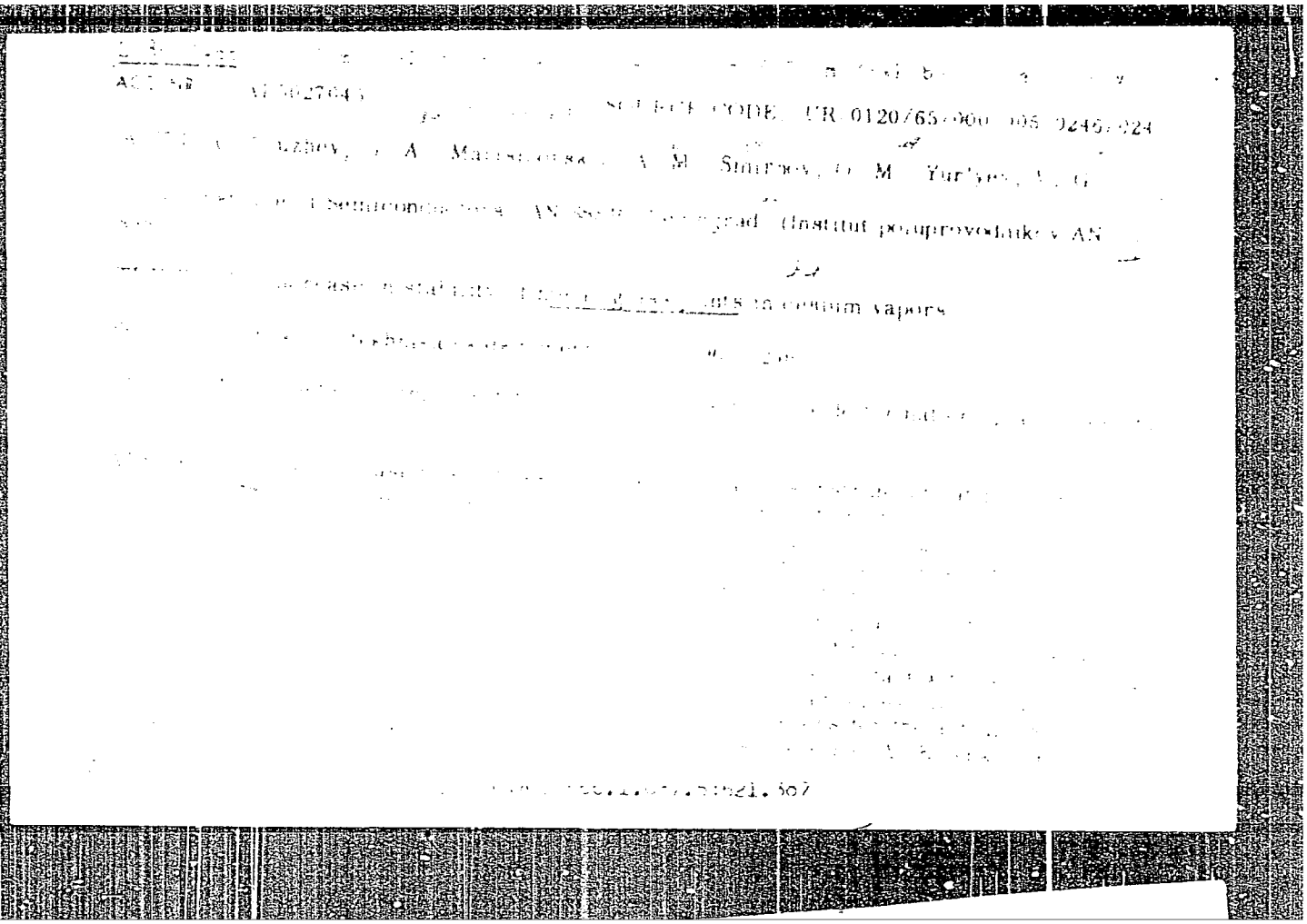
"Investigation of Physical Properties of Weakly Ionized Cesium Plasma and Operating Conditions of Plasma Transformers."

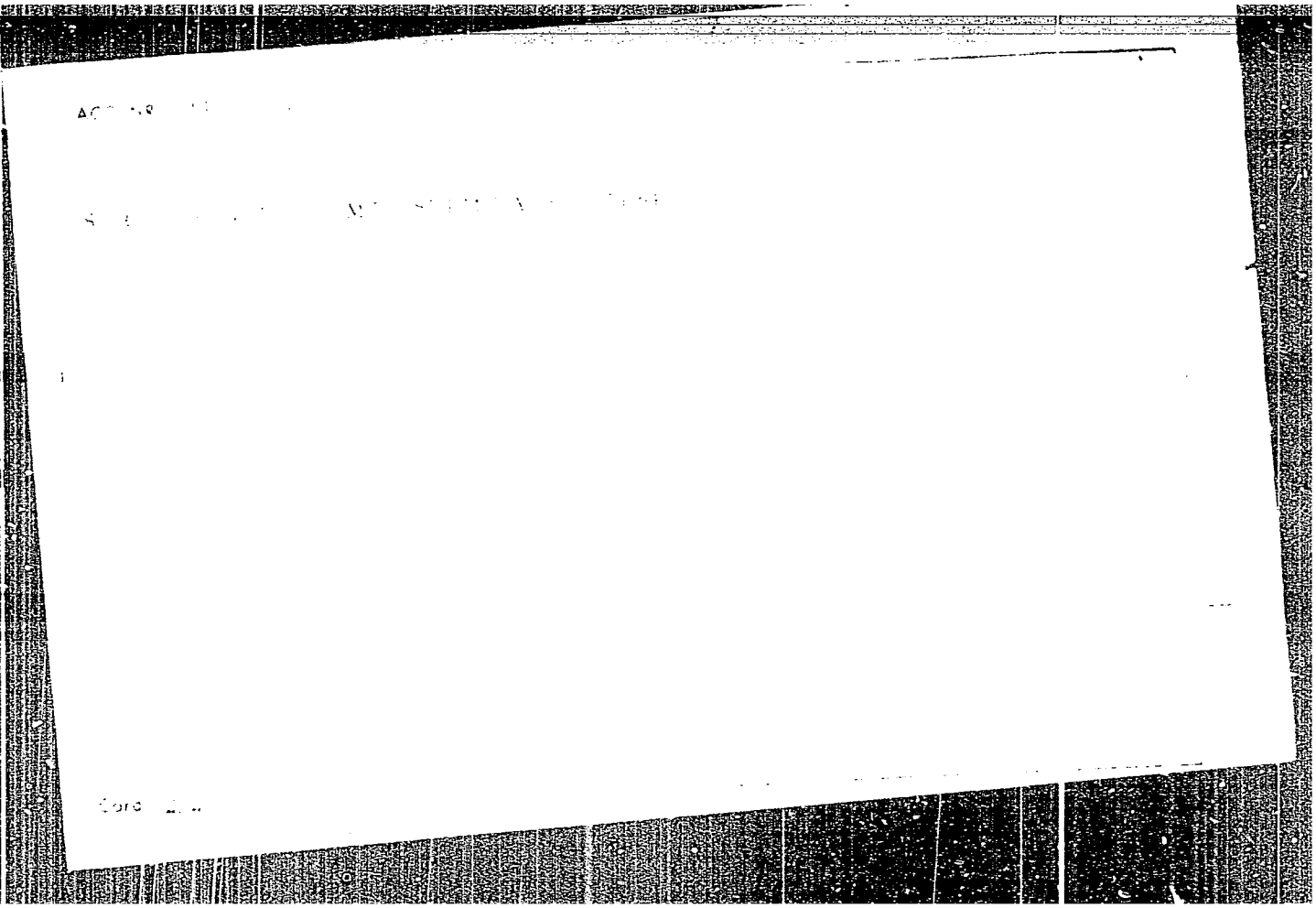
Vest. Akad. Nauk SSSR. No. 4, Moscow, 1963, pages 119-145

MARTSINOVSKIY, A.M.; PIKUS, G.Ye.; SONIN, B.E.; YUR'YEV, V.G.

Effect of interelectrode barriers on the electroconductivity of a cesium plasma. Zhur. tekh. fiz. 32 no.6:770-772 Je '62. (MIRA 15:7)

1. Institut poluprovodnikov AN SSSR, Leningrad.
(Plasma (Ionized gases)—Electric properties)
(Electrodes)





L 63210-65 EWT(l)/EPA(s)-2/EPF(c)/EWG(k)-2/EPF(n)-2/EWG(m)/EPA(w)-2/
T/EWA(c) Pz-6/Pr-4/Pt-7/Peb IJP(c) JEB/TT/WW/AT
ACCESSION NR: AP5015646 UR/0057/65/035/006/1160/1162

AUTHOR: Yuzhev, G. A.; Martsinovskiy, A. M.; Pikus, G. Ye.; Yur'yev, V. G. 50 B

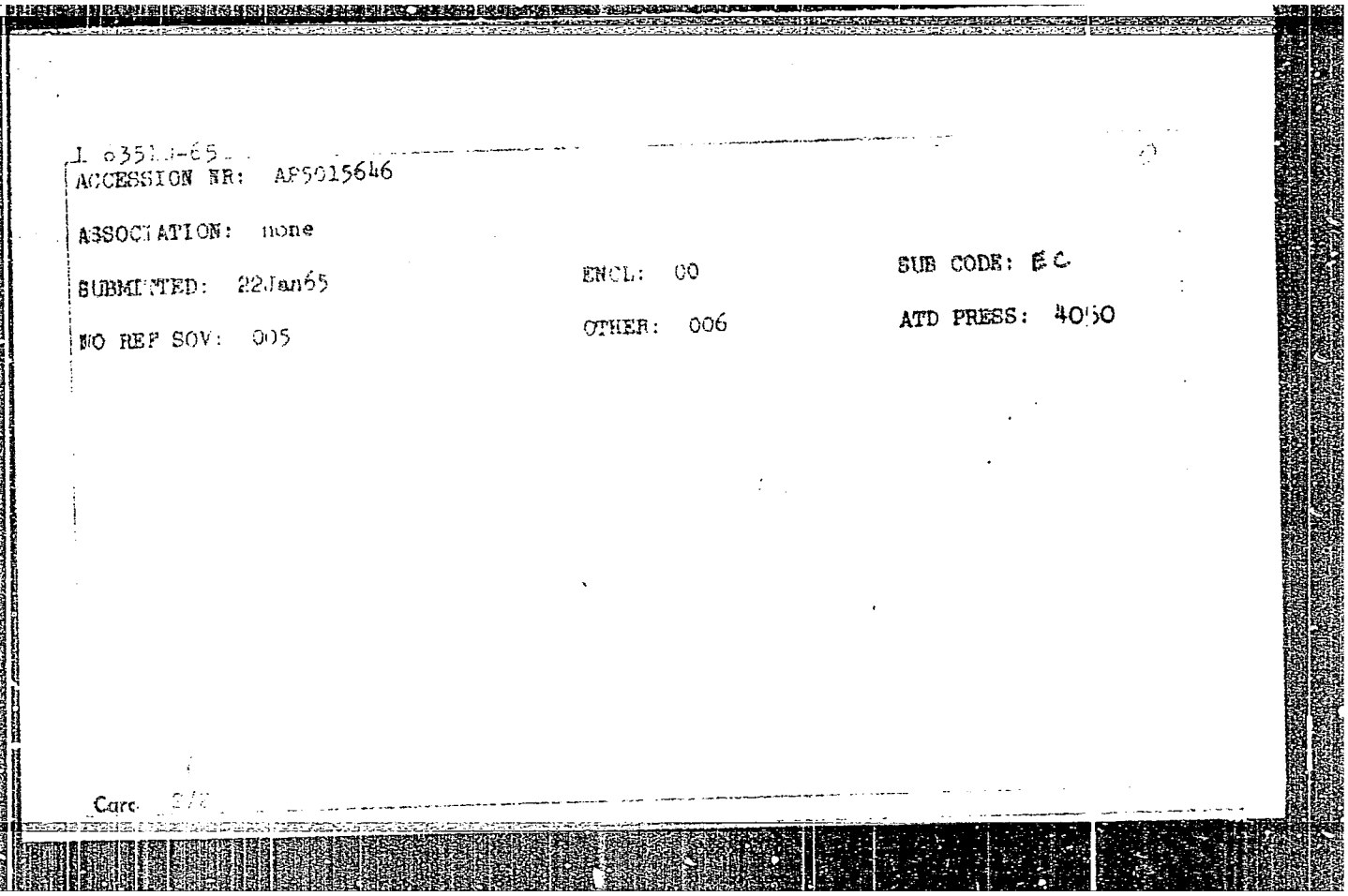
TITLE: On the most effective modes of operation of the thermionic converter 25

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 6, 1965, 1160-1162

TOPIC TAGS: energy conversion, thermionics, space charge, arc mode, thermal emission, thermionic converter

ABSTRACT: The generally accepted view that, if only proper cathode materials could be produced, the direct-path plasma mode (vacuum with compensated space charge) would be the most effective method of thermionic energy conversion is thought to be questionable and arguments are advanced to support the arc mode. The arc mode is considered to be superior in that it makes possible the use of low work-function emitters, whereas in the direct-path mode the space-charge neutralization is accomplished by ions generated in the volume. This advantage can become even more pronounced due to the presence of the anomalous Schottky effect. A comparison of published experimental data on the operation of the two modes demonstrates the superiority of the arc mode for the range of temperatures between 1400 and 2200K. Orig. art. has: 1 figure. [ZL]

Card 1/2



L 03513-65
ACCESSION NR: AP5015646

ASSOCIATION: none

SUBMITTED: 22Jan65 ENCL: 00 SUB CODE: EC

NO REF SOV: 005 OTHER: 006 ATD PRESS: 4050

Card 1/2

IJP(c)

Martsinovskiy, A. M.; Pikus, G. Ye.; Tsirkel', B. I.

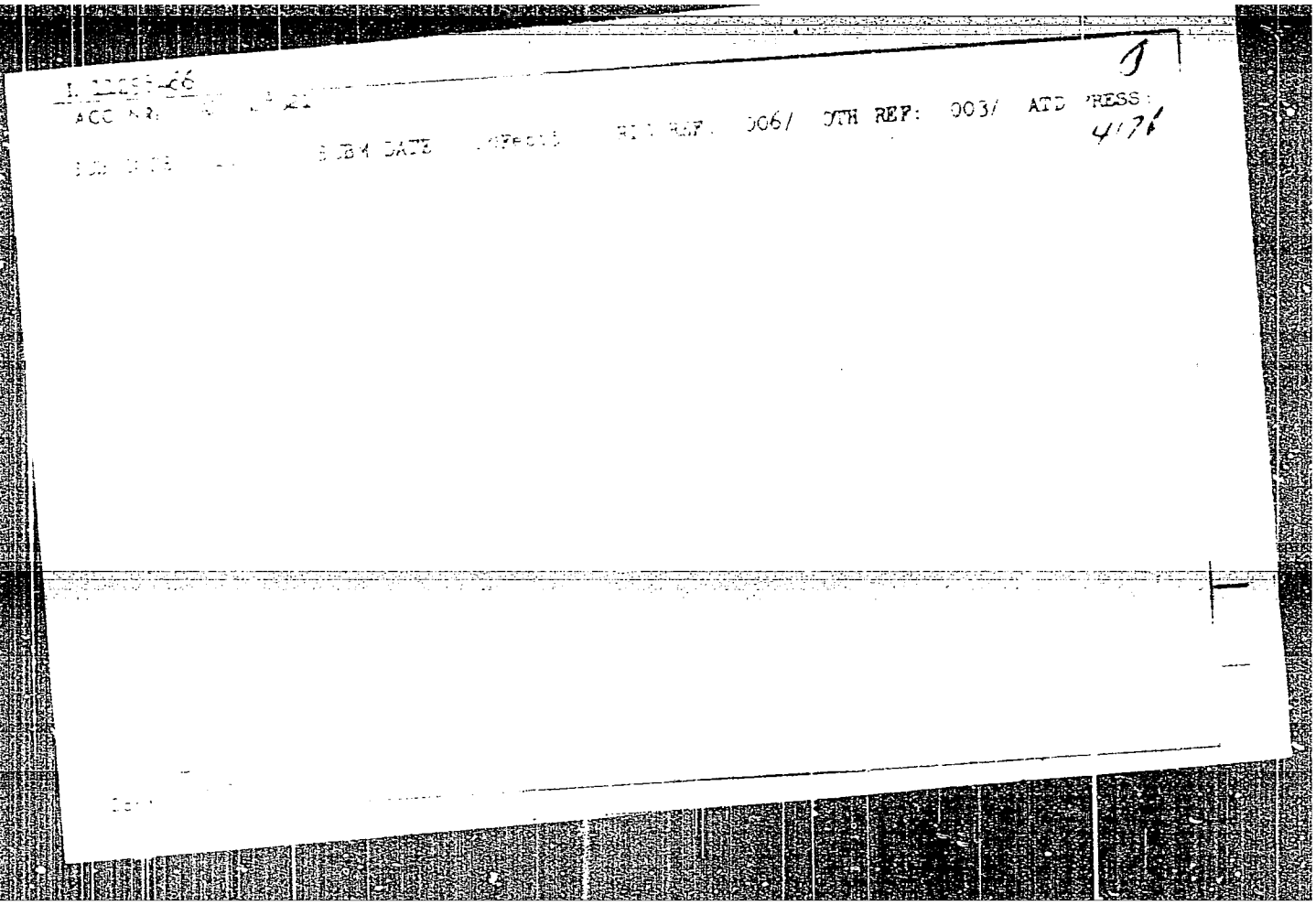
...teristics of plasma ... converters

... energy conversion, thermi...

...filled thermionic energy con-... modes of operation. ... surface ... diffusion mode, the ... took place ... experiments of an accelerating field at ... current was close to the emission ... field. The absence of saturation ... characteristics ... connected with the anomalous ... arising as the result of the cathode barrier. Orig. art. has: 6 for-...

[ZL]

Card 1/2 UDC: 537.523.5



DYUZHEV, G.A.; MARTSINOVSKIY, A.M.; TSIRKEL', B.I.; YUR'YEV, V.G.

Circuit for reading the oscillographic volt-ampere characteristics in a wide range of currents. Prib. i tekh.eksp. 10 no.5:115-117 S-O '65. (MIRA 19:1)

1. Institut poluprovodnikov AN SSSR, Leningrad. Submitted July 10, 1964.

MARTSINOVSKIY, A.M.; TSIRKEL', B.I.; YUR'YEV, V.G.

System for the stabilization and regulation of the cathode temperature. Prib. i tekh.eksp. 10 no.5:238-240 S-O '65. (MIRA 19:1)

1. Institut poluprovodnikov AN SSSR, Leningrad. Submitted July 10, 1964.

DYUZHEV, G.A.; MARTSINOVSKIY, A.M.; SMIRNOV, O.M.; YUR'YEV, V.G.

Increasing the stability of glass-to-metal seals in cesium vapors. Prib. i tekh.eksp. 10 no.5:246 S-O '65. (MIRA 19:1)

1. Institut poluprovodnikov AN SSSR, Leningrad. Submitted July 11, 1964.

L 04609-67 EWT(1)/T IJP(c) AT

ACC NR: AP6033429 SOURCE CODE: UR/0057/66/036/010/1901/1904

AUTHOR: Kaplan, V. B.; Moyzhes, B. Ya.; Pikus, G. Ye.; Shakhnazarova, G. A.; Yur'yev, V. G.

ORG: Institute of Semiconductors, AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

90
B

TITLE: Spectroscopic measurements of the plasma parameters of a thermionic converter

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 10, 1966, 1901-1904

TOPIC TAGS: thermionic energy conversion, arc discharge, plasma arc, plasma dynamics, plasma diffusion, spectroscopy

ABSTRACT: The plasma parameters (concentration, electron temperature, proportion of excited atoms, etc.) in an arc-mode thermionic converter were optically determined by means of a mirror monochromator with photoelectric registration and potentiometric recording. Care was taken to exclude from the treatment the long-wave lines of the P-D and F-D transitions, which showed significant adsorption, and to eliminate the cathode illumination while the measurements of the continuum intensity were being taken. The investigations were made at cathode temperatures from 1100 to 1600K and at cesium vapor pressures from 0.4 to 2.0 mm hg. The interelectrode distances varied from 1 to 2.0 mm. The investigation demonstrated that the electron temperature decreases monotonically between the cathode and anode. The maximum of the electron

Card 1/2 UDC: 533.9.082.5

concentration was found at a distance of 0.3 mm from the cathode. It was also found that the distribution of the excited atom concentration does not follow the changes of the electron temperature. The transition from generation to recombination takes place close to the point at which the temperature and line intensity curves intersect. If it is assumed that at this point neither generation nor recombination occurs, then the concentration of electrons and excited atoms at this point should be close to the thermodynamic equilibrium. At T_e = 2500K, the thermodynamic concentration should be 1.25×10^{14} cm^{-3} (the measured concentration was 7×10^{13} cm^{-3}). From their own calculations and a discussion of the less pronounced changes of the electron temperature registered by other researchers using the probe method, the authors conclude that the plasma of a thermionic converter operating under the investigated conditions is essentially of the nonequilibrium type. Orig. art. has: 2 formulas and 3 figures.

SUB CODE: 20/ SUBM DATE: 04Dec65/ ORIG REF: 010/ OTH REF: 004/ ATD PRESS: 5100

L 47035-66 EEC(k)-2/EWT(1)/EWT(m)/T/EWP(t)/ETI IJP(c) RTW/TT/AT/WW/JD

ACC NR: AP6031273 SOURCE CODE: UR/0057/66/036/009/1685/1697

AUTHOR: Dyuzhev, G. A.; Baksht, F. G.; Martsinovskiy, A. M.; Moyzhes, B. Ya.; Pikus, G. Ye.; Yur'yev, V. G.

ORG: none

TITLE: Probe-method investigation of the plasma in thermionic converters with high cesium pressure. III. Distribution of the concentration, the electron temperature, and the space potential in the interelectrode gap of thermionic converters

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 9, 1966, 1685-1697

TOPIC TAGS: thermionic energy conversion, direct energy conversion, arc discharge, cesium electron tube

ABSTRACT: Specially constructed instruments with movable probes were used in extensive investigations of the operation of a cesium-filled thermionic converter. The investigations were carried out at pressures characteristic of both the diffusion and arc modes. The measurements confirm the theory of the diffusion mode advanced in 1960 by Moyzhes and Pikus (Moyzhes, B. Ye., and Pikus, G. Ye., FTT, 2, 756, 1960). They also show that, at low cathode temperatures, the ionization starts in this mode next to the anode in the region of the anode drop. The transition to the arc mode is accompanied by a redistribution of the potential and a shifting of the ionization region toward the cathode. In the arc mode, a substantial part of the applied volt-

Card 1/2

L 47035-66

ACC NR: AP6031273

age drops on the near-cathode barrier and in the region close to the cathode. Next to the anode and in the anode region there is only a small potential barrier, which vanishes with increasing current. The electron temperature in the gap appears to be almost constant, although it increases slowly with increasing current. At the same time, the carrier concentration increases rapidly when current increases. The values of electron concentration and temperature obtained by the authors agree with those obtained by other researchers in spectral measurements. While they consider their method highly useful and accurate, the authors concede that, unlike optical methods, it does not yield information on the degree of equilibrium in the plasma. Orig. art. has: 9 formulas, 10 figures, and 2 tables. [ZL]

SUB CODE: 20/ SUBM DATE: 04Sep65/ ORIG REF: 009/ OTH REF: 007/ ATD PRESS: 5089

Card 2/2

ACC NR: AP6013125 SOURCE CODE: UR/0057/66/036/004/0692/0703

AUTHOR: Dyuzhev, G. A.; Martsinovskiy, A. M.; Moyzhes, B. Ya.; Pikus, G. Ye.; Yur'yev, V. G.

ORG: none

TITLE: Plasma sounding in thermoemission converters with high-pressure cesium vapors. II. Verification of the probe method. Certain experimental results obtained in the diffusion and arc modes

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 4, 1966, 692-703

TOPIC TAGS: plasma probe, plasma arc, plasma diffusion, thermoelectric converter, cesium plasma

ABSTRACT: This paper is a continuation of the theoretical work on the plasma probing which appeared in the same issue of ZhTF (pp. 679-691). The equipment and the data processing methods were checked experimentally using an isothermal plasma which was diffusion- or arc- generated in an interelectrode gap of a thermoemission converter with high-pressure cesium vapor. The experimental results show that in an isothermal plasma with known parameters, the probing method yields data on the electron concentration and the space potential when the length of the free path is smaller

Card 1/2 UDC: 533.9.07

ACC NR: AP6013125

than the probe dimensions. In this connection, elevated values of electron temperature were obtained. The divergence is due to a large thermoelectron emission of the probe and a slow energy transfer between the fast and slow electrons. Measurements carried out in the diffusion mode are in agreement with theory presented elsewhere (Moyzhes, B. Ya., and G. Ye. Pikus, FTT, 2, 756, 1960). Measurements carried out in the arc mode indicate that the cesium plasma generated between the electrodes of a thermoemission converter differs greatly from a plasma in conventional gas-discharge equipment. The electron temperature is low, approximately 2500°K at all the test points of a v-a curve, and the ionization does not exceed 1%. The fact that a plasma in a thermoemission converter remians sufficiently cold can be used to achieve high-efficiency conversion of thermal to electrical energy. The experimental values of the electron temperature and concentration for the arc mode are essentially in agreement with those calculated and presented by Moyzhes et al. (ZhTF, 35, 1621, 1965). In general, the measurements in an isothermal plasma show that the experimental equipment and methods used have yielded satisfactory results and can be used in a study of nonisothermal plasma. The authors thank Yu. M. Kagan, V. I. Perel', and F. G. Bakshta for useful evaluation of results and for valuable advice. The authors thank Yu. M. Kagan, V. I. Perel', and F. G. Baksht for useful discussions and valuable advice. Orig. art. has: 12 figures and 1 table.

SUB CODE: 20 / SUBM DATE: 21Jun65 / ORIG REF: 009 / OTH REF: 007

Card 2/2

YUR'YEV, V. I.

Yur'yev, V. I. - "Exchange adsorption on cellulose materials," --In table of contents third author: T. I. SHURIKHINA ---Materialy Tsentr. nauch.-issled. in-ta bumazh. prom-sti, Issue 37, 1948, p. 83-106 --- Bibliog: p. 104-06

So: U-3566, 15 March 53, (Letopis 'Zhurnal 'nykh Statey, No. 13, 1949)

YUR'YEV, V.I.

Yur'yev, V.I. and Pozern, T.P. "On the potentiometric titration of bisulphite with chloramine "T", Trudy Lesotekh. adad. im. Kirova, No. 63, 1948, p. 121-26,

SO: U-3042, 11 March 53, (Letopis 'nykh Statey, No.9, 1949)

YUR'YEV, V. I.

AID P - 3933

Subject : USSR/Chemistry

Card 1/1 Pub. 152 - 16/19

Authors : Yur'yev, V. I., S. S. Pozin, and L. N. Bilich

Title : Effect of grinding on the electrokinetic properties of sulfite pulp.

Periodical : Zhur. prikl. khim. 28, 10, 1131-34, 1955

Abstract : The electrokinetic potential of sulfite pulp decreases the higher its degree of disintegration though not to the same extent. The change of electrokinetic properties was ascribed to the increase in the adsorbability of cellulose. Three tables, 2 references, 2 Russian (1950-52).

Institution : Leningrad "Order of Lenin" Academy of Wood Technology im. S. M. Kirov.

Submitted : F 18, 1954

YUR'YEV, V.I.

YUR'YEV, V.I.; POZIN, S.S.; BILICH, L.N.

Electrokinetic properties of cellulose fiber materials.
Khim.nauka i prom. 2 no.5:670-672 '57. (MIRA 10:12)

1.Lesotekhnicheskaya akademiya im. S.M. Kirova.
(Cellulose)

SKURIKHINA, G.N.; YUR'YEV, V.I.

Studying exchange-adsorption properties of monocarboxycellulose. Trudy LTA no.80 pt.2:37-45 '58. (MIRA 13:4)
(Cellulose)

SKURIKHINA, G.M.; Yur'yev, V.I.

Effect of cation concentration on the exchange and adsorptive activities of carboxycellulose. Trudy LTA no.87:73-77 '59. (MIRA 13:4)

(Cellulose)

83266

S/109/60/005/009/012/026
E140/E455

9.4230 1052 1071

AUTHOR: Yur'yev, V.I.

TITLE: Interaction of Electron Stream with Dielectric Delay Structure

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.9, pp.1458-1466

TEXT: The dispersion equation of a system with dielectric in a metal waveguide in the presence of an electron beam is obtained under the following assumptions, valid for linear TWT theory: 1) uni-velocity electron stream; 2) small signal amplitude; 3) exponential variation of signal along the z-axis; 4) an electron stream completely filling the channel; 5) absence of space charge; 6) infinitely long or matched systems; 7) lossless dielectric. The author's results indicate that the requisite mechanical precision of such a system will be less than, for example, that of TWT's with helical structures. Therefore, the real gain obtained may be closer to the theoretical than in the latter case. There are 7 figures and 12 references: 8 Soviet, 3 English and 1 French.

SUBMITTED: August 4, 1959

Card 1/1

YUR'YEV, V.I.; SKURIKHINA, G.M.

Ion-exchange capacity of monosubstituted phthalic and maleic esters of cellulose. Zhur. prikl. khim. 33 no.12:2803-2805 D '60. (MIRA 14:1)

(Ion exchange) (Cellulose)

GEKKER, Ivan Romanovich; YUN'YEV, Valentin Ivanovich; VOZNESENSKIY, V.I., red.; VORONIN, K.P., tekhn. red.

[Submillimeter waves] Submillimetrovye volny. Moskva, Gos. energ.izd-vo, 1961. 63 p. (MIRA 14:12)
(Microwaves) (Radio)

33214

S/141/61/004/005/020/021
E039/E120

9,1300

AUTHOR: Yur'yev, V.I.

TITLE: Interaction characteristics for an electron flow and a dielectric decelerating structure in the shape of a thin walled cylinder in a metallic waveguide

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, v.4, no.5, 1961, 978-981

TEXT: The interaction of an electron flow and a dielectric structure was examined in an earlier paper (Ref.1: V.I. Yur'yev, Radiotekhnika i elektronika, v.5, 1458 (1960)) for the case

$$|\gamma_0^2| \sim |\omega^2 \mu_2 \varepsilon_2| \quad (1)$$

where: γ_0 is the wave propagation constant without electron flow; ω is the signal frequency; μ_2 is the magnetic permeability; ε_2 is the dielectric permeability.

When $|\gamma_0^2| < |\omega^2 \mu_2 \varepsilon_2|$ the specific amplification G is low

Card 1/ 3

(1 - 2 db cm^{-1}). However, when the parameter $P = R/a$ is decreased, G increases (R is the radius of the dielectric structure and a the radius of the axial channel). If also $\varepsilon_r = \varepsilon_2/\varepsilon_o \sim 10^2$ the phase velocity of the wave grows rapidly. Practical values of v_ϕ/c can be obtained by using barium titanates for which $\varepsilon_r \sim (1 \div 8)\ 10^3$. For the case when $|\omega^2 \mu_o \varepsilon_o| \ll |\gamma_o^2| \ll |\omega^2 \mu_2 \varepsilon_2|$ the relationships found in the above-mentioned paper (Ref.1) apply. The results for such a system are plotted in Fig.1, which shows in graph (a) the relation between G (db.cm^{-1}) and γ_o for different values of P and ε_r when $\omega_e^2/\omega^2 = 7.5 \times 10^{-5}$ and $\omega = 18.8 \times 10^{10}$ sec^{-1}, and in graph (b) the relation between current I and γ_o for different values of P and ε_r ($\omega_e^2/\omega^2 = 7.5 \times 10^{-5}$; $\omega = 18.8 \times 10^{10}$ sec^{-1}).

This shows that high values of γ_o are preferable. The relation between v_ϕ/c and γ_o is examined and a curve

Card 2/ 3

Interaction characteristics for ...

plotted for $G_1 = f(\omega)$ in Fig.3. This also shows the relation between G_2 for corresponding values of current I, and current density δ with ω_e^2/ω^2.

This demonstrates that for $\delta \sim 2$ amp.cm^{-2} an amplification up to 10 db.cm^{-1} could be obtained in practice by the use of dielectric waveguides.

There are 3 figures and 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc. The English language reference reads as follows:

Ref.3: P.P. Coleman, R.C. Becker, IRE Trans., MTT-7, v.1, 42 (1959).

ASSOCIATION: Institut radiotekhniki i elektroniki AN SSSR (Institute of Radio Engineering and Electronics, AS USSR)

SUBMITTED: March 2, 1961

Card 3/3

YUR'YEV, V.I.; POZIN, S.S.

Electrokinetic properties of monocarboxyl cellulose and some acid esters of cellulose [with summary in English]. Koll.zhur. 23 no.4:499-503 Jl-Ag '61. (MIRA 14:8)

1. Lesotekhnicheskaya akademiya im. S.M. Kirova, Kafedra fizicheskoy i kolloidnoy khimii, Leningrad.
(Cellulose) (Surface chemistry)